

Male partners' involvement in prevention of mother-to-child HIV transmission in sub-Saharan Africa: A systematic review

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Abstract

In sub-Saharan Africa (SSA), male partners are rarely present during prevention of mother-to-child transmission (PMTCT) services. This systematic review aims to synthesize, from a male perspective, male partners' perceived roles, barriers and enablers of their involvement in PMTCT, and highlights persisting gaps. We carried out a systematic search of papers published between 2002 and 2013 in English on Google Scholar and PubMed using the following terms: men, male partners, husbands, couples, involvement, participation, Antenatal Care (ANC), PMTCT, SSA countries, HIV Voluntary Counseling and Testing and disclosure. A total of 28 qualitative and quantitative original studies from 10 SSA countries were included. Men's perceived role was addressed in 28% (8/28) of the studies. Their role to provide money for ANC/PMTCT fees was stated in 62.5% (5/8) of the studies. For other men, the financial responsibilities seemed to be used as an excuse for not participating. Barriers were cited in 85.7% (24/28) of the studies and included socioeconomic factors, gender role, cultural beliefs, male unfriendly ANC/PMTCT services and providers' abusive attitudes toward men. About 64% (18/28) of the studies reported enablers such as: older age, higher education, being employed, trustful monogamous marriages and providers' politeness. In conclusion, comprehensive PMTCT policies that are socially and culturally sensitive to both women and men need to be developed.

Keywords: sub-Saharan Africa, PMTCT, men's role, barriers, enablers

Résumé

En Afrique sub-saharienne (ASS) les partenaires masculins sont rarement présents dans les services de PTME. Cette revue systématique de la littérature a pour objectif de synthétiser, du point de vue des hommes, les rôles perçus des partenaires masculins, les barrières et les facteurs facilitateurs de leur participation dans les services de PTME, et met en exergue les lacunes qui persistent. Nous avons mené une recherche systématique d'articles publiés en anglais entre 2002 et 2013 dans Google Scholar et PubMed en utilisant les mots clés: hommes, partenaires masculins, maris, couples, implication, participation, CPN, PTME, pays d'Afrique sub-saharienne, testage et conseil volontaire pour le VIH et annonce des résultats. Un total de vingt-huit études originales, qualitatives et quantitatives menées dans dix pays d'ASS, ont été incluses. Le rôle perçu des hommes était analysé dans 28% (8/28) des études. Leur rôle de pourvoir aux frais des CPN/ services de PTME était cité dans 62.5% (5/8) des études. Pour d'autres hommes, les responsabilités financières semblaient être utilisées comme une excuse pour ne pas s'impliquer. Les barrières à la participation des hommes étaient citées dans 85.7% (24/28) des études et incluaient des facteurs socio-économiques, le facteur genre, les croyances culturelles, les services de CPN/PTME peu accueillants pour les hommes et les attitudes abusives des professionnels de santé envers les hommes. Environ 64% (18/28) des études reportaient des facteurs

facilitateurs de la participation des hommes comme: l'âge mûr, éducation supérieure, avoir un emploi, époux monogames et fidèles et la politesse des professionnels de santé. En conclusion, des politiques exhaustives de PTME, qui sont socialement et culturellement adaptées aux femmes aussi bien qu'aux hommes devraient être mises en place.

Mots Clés: Afrique sub-saharienne, PTME, rôle des hommes, barrières, facteurs facilitateurs

Introduction

Every year, an estimated 1.5 million HIV-positive women become pregnant, and 90% of total HIV infections in children that are acquired through mother-to-child transmission (MTCT) during either pregnancy, labor or breastfeeding occur in sub-Saharan African (SSA) countries (UNAIDS 2013). A study carried out in Zambia shows that the majority of HIV transmission is reported to occur within stable couples (Dunkle, Stephenson, Karita, Chomba, Kayitenkore, Vwalika, *et al.* 2008), the highest risk being women with low control over their sexuality (Bhagwanjee, Govender, Reardon, Johnstone, George & Gordon 2013; Greiga, Peacock, Jewkes & Msimang 2008), low risk perception for HIV acquisition and whose male sexual partners have relatively high-risk sexual behaviors (Larsson, Thorson, Nsabagasani, Namusoko, Popenoe & Ekström 2010). In spite of remarkable achievements in the reduction of new HIV infections from 3.4 (3.1–3.7) million in 2001 to 2.3 (1.9–2.7) million in 2012, challenges remain. In the most affected SSA countries, HIV and AIDS-related diseases are still amongst the main causes of disease and death among women and children (UNAIDS 2013).

Programs to curtail mother-to-child HIV transmission (PMTCT) have been in place for almost 15 years worldwide. In most affected SSA countries, PMTCT is a component of antenatal care. Currently, there is increased access to free anti-retroviral drugs for PMTCT globally, which are also more effective, with simpler dosing and easy storage (WHO 2012). Taking advantage of anti-retroviral drugs availability, countries with a high HIV and AIDS burdens are escalating the provision of PMTCT interventions to respond to demands in underserved areas. The expansion needs innovation in order to strengthen the traditional PMTCT approach, which addresses only women and children, such as to include male partners. There is overwhelming evidence that male partners' participation in PMTCT is fundamental (Reece, Hollub, Nangami & Lane 2010; Semrau, Kuhn, Vwalika, Kasonde, Sinkala, Kankasa, *et al.* 2005; Theuring, Mbezi, Luvanda, Jordan-Harder, Kunz & Harms 2009), is strongly recommended by World Health Organization and has been contemplated in strategies of many MTCT control programs.

Male partner involvement is an important factor in reducing PMTCT refusal by women, as well as delayed enrollment and dropout rates (Conkling, Shutes, Karita, Chomba, Tichacek, Sinkala, *et al.* 2010; Kalembo, Zgambo, Mulaga, Yukai & Ahmed 2013; Theuring *et al.* 2009). Their involvement also increases male partners' opportunities for HIV testing and eventually early initiation of anti-retroviral treatment. Despite these benefits, male partner attendance in PMTCT is still very low (Falnes, Moland, Tylleskär, De Paoli, Msuya, & Engebretsen 2011; Kiarie, Farquhar, Richardson, Kabura, John, Nduati, *et al.* 2006; Larsson *et al.* 2010; Msuya, Mbizvo, Hussain, Uriyo, Sam

& Stray-Pedersen 2008; Orne-Gliemann, Tchendjou, Miric, Gadgil, Butsashvili, Eboko, *et al.* 2010; Semrau *et al.* 2005; Theuring *et al.* 2009) and seems to be promoted exclusively to improve PMTCT uptake and outcomes benefitting women and children.

From a social perspective, traditional systems in both rural and urban settings in most SSA communities are deeply rooted in male authority over women's health, particularly in its sexual and reproductive aspects (Larsson *et al.* 2010; Orne-Gliemann *et al.* 2010). Therefore, in these SSA settings, with the predominance of HIV heterosexual transmission, safeguarding current achievements and furthering PMTCT improvements demand combined actions that include women and their male partners as actors toward interruption of MTCT of HIV infection.

Review aims

This systematic review aims to identify and synthesize men's perceived role, barriers and enablers regarding their involvement in PMTCT in SSA countries and highlight persisting gaps.

Methods

To be well informed on the subject of this study, we carried out a systematic search in English on Google Scholar, and PubMed. Additional searches were carried out on WHO, UNAIDS, UNICEF, UNFPA publications and local gray literature. However, the systematic presentations here were limited to published articles in peer-reviewed journals, between January 2002 and December 2013. The terms used in the search included: men, male, husbands, couples involvement, participation Antenatal Care (ANC), PMTCT, SSA countries, HIV Voluntary Counseling and Testing (VCT), VCT, HIV Testing, HIV Disclosure, in different combinations accordingly. Published articles reporting on male involvement with PMTCT, HIV counseling and testing and sero-status disclosure were sought after. Specifically, the main outcomes sought were men's perceived role, barriers, obstacles, facilitators, predictors and enablers to PMTCT. Studies were identified through their titles, retrieved and screened abstracts and full texts, and lastly, the articles were assessed for eligibility and inclusion in this systematic review. Duplicated studies were eliminated. To be eligible for this review, the study was required to be an original qualitative or quantitative study carried out in SSA, addressing men's involvement in PMTCT, HIV counseling and testing and sero-status disclosure from a male perspective. Studies were excluded if not carried out in SSA, not related to PMTCT, reported women's perspectives, and did not include men's perspectives. Each abstract and/or full paper selected was read several times, data were extracted regarding, country, authors, study aim, study site and population, male partner PMTCT attendance, HIV counseling and testing, sero-status disclosure, perceived male role, barriers (obstacles,

hindrances) and enablers (predictors, facilitators). RM analyzed and summarized the data. MS and OD reviewed the processes of studies selection and data extraction analyses (Fig. 1).

Results

Included studies

Twenty-one studies were retrieved from the systematic review process and seven from studies' references (Fig. 2). Thirteen (46%) were qualitative, 11 (39%) quantitative (6 cohort, 5 cross sectional) and 4 (14%) mixed (cross-sectional with qualitative components). The studies were from: Uganda 6 (21%), Tanzania 5 (17%), Kenya 5 (17%), Zambia 4 (14%), South Africa 3 (10%), Cameroon 2 (7%), Malawi 2 (7%), Ivory Coast 1 (3%), Democratic Republic of Congo 1 (3%), and Rwanda 1 (3%).

In 50% (14/28) of the studies, men were recruited indirectly through their female partners at ANC/PMTCT clinics. Outside PMTCT clinic settings, recruitment of men was mostly done directly, through letters to them at their homes (Falnes *et al.* 2011; Karamagi, Tumwine, Tylleskar & Heggenhougen 2006;

Larsson *et al.* 2010), at social spaces (Falnes *et al.* 2011; Larsson *et al.* 2010), farms (Falnes *et al.* 2011; Larsson *et al.* 2010; Nkuoh, Meyer, Tih & Nkfusai 2010), work places (Semrau *et al.* 2005), sports venues, churches, (Falnes *et al.* 2011; Semrau *et al.* 2005), bars (Semrau *et al.* 2005), in communities (Duff, Rubaale & Kipp 2012; Falnes *et al.* 2011; Harms, Schulze, Moneta, Baryomunsi, Mbezi & Poggensee 2005; Koo, Makin, & Forsyth 2013b; Kwambai, Dellicour, Desai, Ameh, Person, Achieng, *et al.* 2013; Mohlala, Gregson & Boily 2012; Tweheyo, Konde-Lule, Tumwesigye & Sekandi 2010), agricultural exhibitions and public events (Theuring *et al.* 2009).

(1) *Male partners' perceived roles on PMTCT* were cited in (28%) 8/28 studies. We identified men's perceived direct and indirect roles. The direct role most frequently stated was financial support (Byamugisha, Tumwine, Semiyaga, & Tylleskär 2010; Kwambai *et al.* 2013; Larsson *et al.* 2010; Nkuoh *et al.* 2010; Theuring *et al.* 2009), followed respectively by decision-making, responsibility over women's health (Koo, Makin, & Forsyth 2013a; Kwambai *et al.* 2013; Larsson *et al.* 2010; Theuring *et al.*

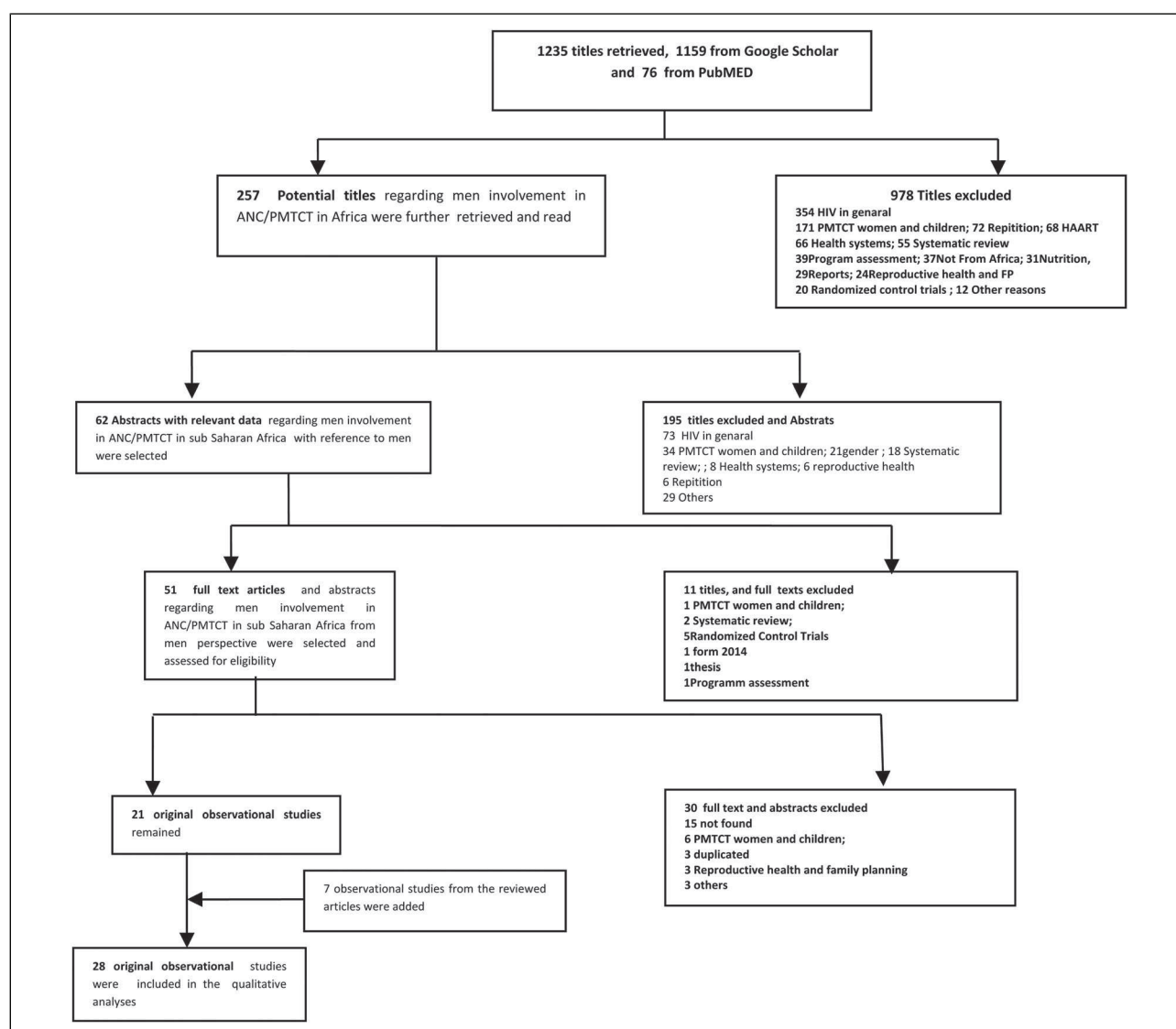


Fig. 1. Procedures used for the selection of articles for the systematic review.

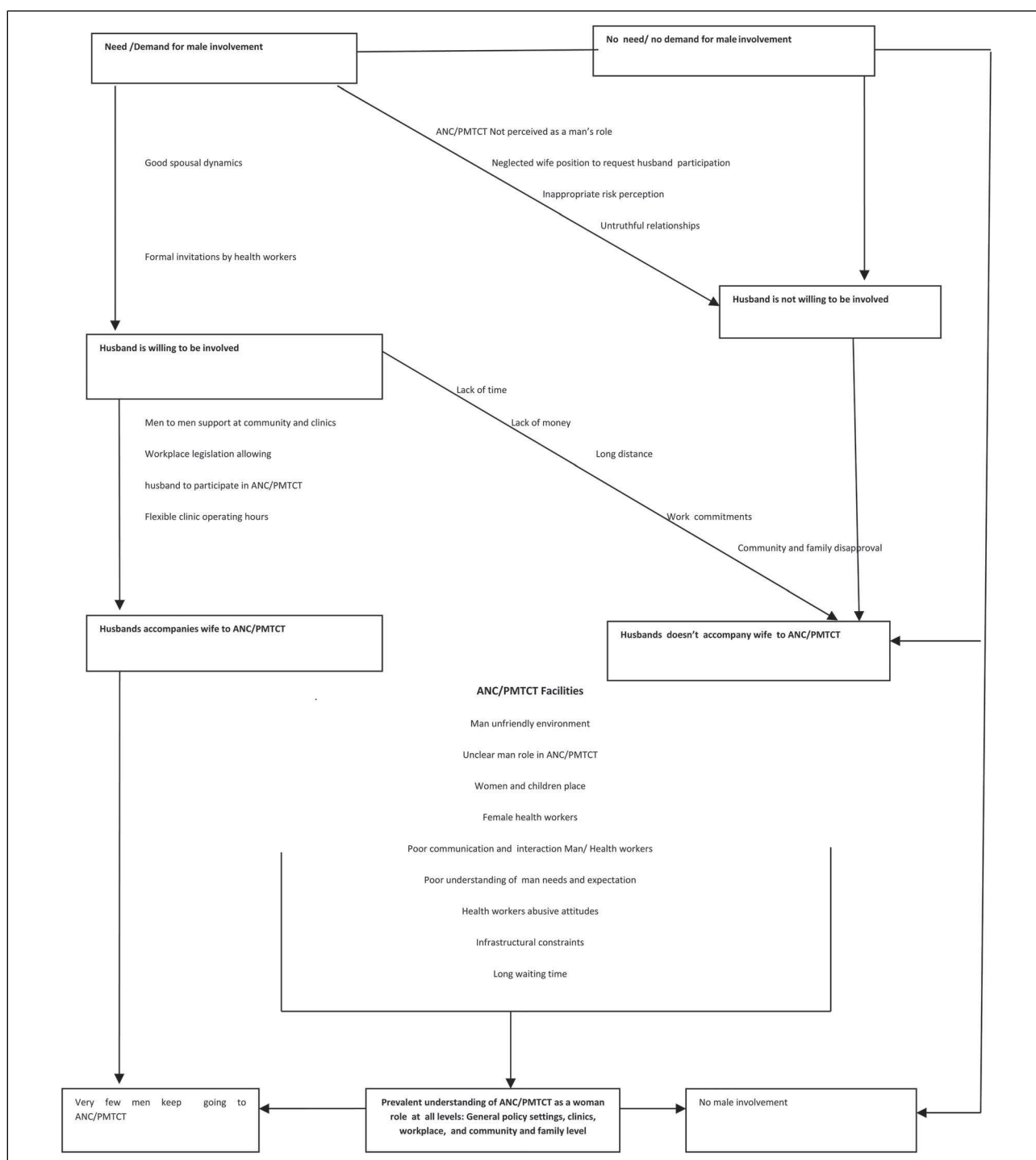


Fig. 2. Factors influencing man involvement in PMTCT.

2009) and help with housework throughout pregnancy (Kwambai *et al.* 2013; Nkuoh *et al.* 2010; Theuring *et al.* 2009). One study referred to indirect support through improvement of communication between couples (Aarnio, Aarnio, Olsson, Chimbiri & Kulmala 2009), faithfulness during pregnancy and support to HIV-positive women (Aarnio *et al.* 2009). Financial support was stated in 62.5% (5/8) of the studies (Tables 1 and 2). Most men reported believing that their main role was that of a breadwinner (Larsson *et al.* 2010; Musheke, Bond & Merten 2013) and provider of money for health expenses, ANC/PMTCT

clinic fees, food and family well-being (Larsson *et al.* 2010; Nkuoh *et al.* 2010; Theuring *et al.* 2009). Nevertheless, the men's role of guaranteeing family income and having to work is often used as an excuse to not accompany their wives to ANC/PMTCT clinics (Kwambai *et al.* 2013; Larsson *et al.* 2010; Musheke *et al.* 2013). According to some men's statements, as part of their responsibility (Aarnio *et al.* 2009; Theuring *et al.* 2009) and in spite of their awareness of women's financial dependence, they assume that women need their permission to go to ANC/PMTCT sessions because only male partners can decide

which clinic to attend and which ANC/PMTCT care they can afford (Kwambai *et al.* 2013; Theuring *et al.* 2009). Other men perceive that they have to persuade women and sometimes obligate them to attend ANC/PMTCT clinics or see a traditional birth attendant in reaction to women's careless health conduct, ignorance or laziness (Kwambai *et al.* 2013). Few men see their role as extending to sharing responsibility during pregnancy, childbirth and child care (Nkuoh *et al.* 2010), as well as helping with cooking and housework (Kwambai *et al.* 2013; Nkuoh *et al.* 2010; Theuring *et al.* 2009) and improving women's diets (Kwambai *et al.* 2013).

(2) *Perceived barriers for male partners involvement in PMTCT* were present in 85% (24/28) of the studies, and comprised socio-economic constraints, health system factors, cultural beliefs, gender inequity, limited knowledge of ANC/PMTCT, mistrustful marriages and inadequate couples' communication patterns.

(2.1) *Socioeconomic barriers cited in 39.2% (11/28) of the studies consisted of:*

(2.1.1) *Distance and financial burdens:* Clinics were too centralized (Byamugisha *et al.* 2010) and far from communities and work places (Byamugisha *et al.* 2010; Duff *et al.* 2012; Larsson *et al.* 2010; Nkuoh *et al.* 2010; Reece *et al.* 2010). Other reasons included the inability to afford transportation particularly for two people (Byamugisha *et al.* 2010; Duff *et al.* 2012; Koo *et al.* 2013a; Larsson *et al.* 2010; Nkuoh *et al.* 2010; Orne-Gliemann *et al.* 2010; Reece *et al.* 2010), lack of transport (Tweheyo *et al.* 2010), the need to pay for HIV testing (Duff *et al.* 2012), pay for care and drugs (Larsson *et al.* 2010; Reece *et al.* 2010), pay illegal extra charges (Larsson *et al.* 2010; Orne-Gliemann *et al.* 2010; Reece *et al.* 2010), and financial conflicts with other urgent household needs (Duff *et al.* 2012).

(2.1.2) *Work commitments:* Overlap of clinic appointment schedules and working hours (Duff *et al.* 2012; Koo *et al.* 2013a; Orne-Gliemann *et al.* 2010; Reece *et al.* 2010; Theuring *et al.* 2009; Tweheyo *et al.* 2010), sporadic jobs and casual labor, jobs with little control of assignments (Reece *et al.* 2010) were frequently cited. The belief that ANC/PMTCT was only for women and children had negative impact at men's workplace leading them not to request leave to attend PMTCT clinics (Theuring *et al.* 2009). Accompanying women to PMTCT was a stigma for men, as they feared not being authorized by their employers to attend PMTCT with their spouses, and worried with confidentiality issues linked to HIV/PMTCT (Reece *et al.* 2010).

(2.1.3) *Time constraints:* Time away from job including the waiting time at the clinic (Byamugisha *et al.* 2010; Duff *et al.* 2012; Nkuoh *et al.* 2010; Theuring *et al.* 2009; Tweheyo *et al.* 2010) as well as the time needed for HIV testing, including receiving counseling, testing and returning for results were seen as barriers (Koo *et al.* 2013a; Reece *et al.* 2010). Some men said that they were unable to spend the entire day alongside their partners at clinics (Koo *et al.* 2013a) and that all of the procedures were time consuming (Koo *et al.* 2013a) and a nuisance for them (Tweheyo *et al.* 2010).

(2.2) *Health systems related barriers found in 39% (11/28) studies were as follows:*

(2.2.1) *PMTCT targets and scope:* Men perceive ANC/PMTCT clinics as unfriendly (Koo *et al.* 2013a; Kwambai *et al.* 2013; Larsson *et al.* 2010; Orne-Gliemann *et al.* 2010), dominated by women as both clients and care providers (Koo *et al.* 2013a) and they feel totally ignored (Kwambai *et al.* 2013). ANC/PMTCT interventions were focused on HIV and neglected general wellness, fatherhood and father's roles, a common unmet need particularly expressed by young fathers (Koo *et al.* 2013a; Larsson *et al.* 2010; Theuring *et al.* 2009). HIV testing was not mandatory for male partners within PMTCT (Koo *et al.* 2013a). The few accompanying male partners were frequently asked to wait outside the room (Byamugisha *et al.* 2010; Orne-Gliemann *et al.* 2010; Theuring *et al.* 2009). In this regard, male partners wonder why they should accompany their partners to ANC/PMTCT visits (Byamugisha *et al.* 2010; Theuring *et al.* 2009).

(2.2.2) *PMTCT settings:* The crowded state of the clinics and excess of clients in waiting (Byamugisha *et al.* 2010; Koo *et al.* 2013a; Orne-Gliemann *et al.* 2010; Reece *et al.* 2010), lack of space to accommodate couples in consultation rooms (Byamugisha *et al.* 2010; Koo *et al.* 2013a; Reece *et al.* 2010), uneasiness related to sitting next to unknown women, (Byamugisha *et al.* 2010; Koo *et al.* 2013a; Reece *et al.* 2010), cleanliness and confidentiality issues contributed to lack of male participation (Byamugisha *et al.* 2010). On the other hand, special facilities, days or hours for HIV testing were embarrassing for some men because others might question their HIV sero-status (Falnes *et al.* 2011; Larsson *et al.* 2010). For others, clinics were conceptualized as a place for sick and dying people and they perceived themselves as healthy and in no need to visit clinics (Koo *et al.* 2013a).

(2.2.3) *Health workers' attitudes:* Health workers' attitudes were described by men as embarrassing, rude, and harsh (Koo *et al.* 2013b). Use of abusive words either to pregnant women alone or in the presence of their partners and others (Byamugisha *et al.* 2010; Koo *et al.* 2013b; Kwambai *et al.* 2013; Larsson *et al.* 2010), as well as the worrisome maneuvers over pregnant women's abdomens, potentially hurting them, also contributed to men's lack of participation (Byamugisha *et al.* 2010).

(2.3) *Cultural beliefs and gender roles cited in 60% (17/28) of studies:* Some traditions considered women as inferior to men in social status (Koo *et al.* 2013b) and they were not allowed to lead their male partners (Falnes *et al.* 2011; Larsson *et al.* 2010; Nkuoh *et al.* 2010), or tell them what to do (Falnes *et al.* 2011). Both inviting them to a female gathering and giving their partners ANC/PMTCT information (Koo *et al.* 2013a; Larsson *et al.* 2010) might be interpreted as handing over power to women. Men use their authority to devalue women's demands for their involvement in ANC/PMTCT (Falnes *et al.* 2011; Larsson *et al.* 2010). In some situations, women's HIV testing is considered an indication of prostitution or adultery (Duff *et al.* 2012; Falnes *et al.* 2011; Karamagi *et al.* 2006; Larsson *et al.* 2010; Walcott, Hatcher, Kwena & Turan 2013) and sometimes, regardless of

Table 1. Selected quantitative studies and components.

Study authors and country	Study aim	Study design	Population of interest	Age	Recruitment	Data collection	Role	Barriers	Enables
(Brou <i>et al.</i> 2007) Ivory Coast	To investigate among women tested for HIV within PMTCT the key moments for disclosure of their own HIV status to their partner and the impact on partner HIV testing	Cohort	184 (19.6%) partners were tested for HIV		ANC	Individual questionnaire and HIV testing	Not stated	Not stated	Partners of HIV-positive women, were more likely to be tested if they were educated (46.3% versus 16.7%) Informed of their wife's HIV infection (37.7% versus 10.5%) Living in a monogamous couple (27.6% versus 6.7%), had previous HIV testing experience (100% versus 22%)
(Byamugisha <i>et al.</i> 2010) Uganda	To determine the level of participation of male partners in PMTCT	Mixed	388 men	32 years 199 (51%) were in the 25–34 age	ANC	Individual interviews Use ad hoc male involvement index from 0 to 6	Stated in the qualitative components	Knowledge: men with fear of disclosure of their HIV sero-status results to their spouses (OR: 0.4, 95% CI: 0.2–0.8), and men who were drivers had less male involvement index	Higher education (OR: 1.9, 95% CI: 1.1–3.3; knowing wife HIV sero-status and having heard about PMTCT
(Conkling <i>et al.</i> 2010) Rwanda and Zambia	To explore the feasibility of establishing CVCT at ANC	Prospective cohort	1940 women 956(49%) male partners in CVCT; Lusaka: 1685 women 663(39%) in CVCT	Not identified	ANC	Individual interview.	Not stated	Not stated	CVCT offered on weekends was feasible
(Harms <i>et al.</i> 2005) Uganda, Tanzania	To analyze the status of awareness and knowledge about HIV MTCT and preventive measures of transmission in different population groups and health staff	Cross-sectional	Uganda 440 clients of ANC and outpatient clinics 239 villagers Tanzania 574 persons: 410 clients of ANC and outpatient clinics, 93 villagers	Not identified	ANC and rural and urban villages	Individual interviews Open-ended and closed questions	Not stated	Health systems: lack of HIV/AIDS treatment	Not identified

(Katz et al. 2009) Kenya	To describe male attitudes toward antenatal VCT and correlate with accompanying female partner	Prospective cohort	1993 women come with (16%) 313 of their partners	19–53 yrs	ANC	Individual interviews	Not stated	Not identified	Monogamous Married (>99%), Employed (98%), Monogamous marriages (97%) and lived with their partners (98%), and more than half (55%) had at least one living child
(Kiarie et al. 2006) Kenya	To determine the prevalence of life-time domestic violence before HIV-1 testing and its impact on the uptake of (PMTCT)	Prospective cohort	2231 (71%) women counseled; 313 (10%) came with partners 301 men (96%) accepted HIV-1 testing	Not identified	ANC	Individual Interviews.	Not Stated	Violence Barriers: Partners post-secondary education; Formal marriage; House rent above US\$20 per month	Violence enablers : Polygamous marriage; House with more than three people
(Koo et al. 2013b) South Africa	To examine factors associated with men testing during pregnancy and to elicit men's and women's appropriate ANC/ PMTCT invitation card	Cross-sectional	124 men	25–60 (33.9) yrs	ANC	Individual interviews	Not stated	Communication partners	$P < .05$ Discussed HIV if married to her (52.6% vs. 23.3%, and described his relationship as 'exclusive' (96.5% vs. 83.7) Knowing women's HIV status; Prior discussion of testing in PMTCT, knowing the female partner had tested Disclosure of her test result Would accept partner's invitation; Male testing is important
(Mulongo et al. 2010) DR of Congo	To analyze couples' attitudes toward HIV testing after prenatal HIV testing offered to pregnant women and analyze the males' behavior with regard to their own HIV testing	Cross-sectional	143 male partners	30 yrs (SD, 5.9)	ANC	Individual interviews	Not stated	Lack of time Fear of HIV positive results Knowledge: HIV sero-status equal to their wives	Not stated

(Continued)

Table 1. Continued.

Study authors and country	Study aim	Study design	Population of interest	Age	Recruitment	Data collection	Role	Barriers	Enables
(Msuya et al. 2008) Tanzania	To test whether the high rate of intention to notify partners (90%) translated into actual male partner HCT	Prospective cohort study	A total of 332 (12.5%) male partners came		ANC	Individual interviews	Not identified	Not identified	Older age (trend p .005); married or cohabiting (p .001); 30 USD/month (p .001) and collected their own HIV/STI test results (p .001)
(Nkuoh et al. 2010) Cameroon	To present the barriers to men participating in HIV testing and ANC with their wives	Cross-sectional	252 men	18–60 yrs.	House to house and farm to farm	KAP Questionnaire	To pay ANC/delivery fees; Financial Support; Support in pregnancy; Assistance in cooking and caring	Knowledge: Lack of sickness; Faithful; knowledge of their wives sero-status; Fear of HIV results; lack of time, and money; Where to test Cultural beliefs and gender roles: Pregnancy is a woman's affair; not good; Shameful; Not their custom; community does not think it is normal; if man goes to ANC no one to care for the house	Younger age; Community receptiveness; Free HIV testing. More education on HIV/AIDS
(Semrau et al. 2005) Zambia	To test woman's acceptance of HIV testing and compliance with NVP in a PMTCT program influenced by VCT/CVCT	Prospective cohort	Nine percent (868) of 9409 women were couple counseled 798 (92%) of the men accepted HIV testing	Not identified	ANC HIV testing was promoted by community and male outreach workers at men venues Churches; Workplaces; Taverns, Sports; Saturday clinics	Individual interviews	Not stated	Not stated	Not stated

(Theuring <i>et al.</i> 2009) Tanzania	To fill the gap on male research and learn men's perspective on improving male participation at ANC	Mixed	124 men	22–59 yrs	Agricultural exhibition and community event	Individual interviews	Stated in qualitative components	Knowledge: Unclear concept father Involvement; Cultural beliefs and gender roles: ANC /PMTCT not for men ANC for women and children; Fear of HIV testing and results; Work conflicts Health Systems: Waiting time Wait outside; Why being called to ANC	CVCT; kind reception; Politeness; Value of the services
(Tweheyo <i>et al.</i> 2010) Uganda	To investigate the level, perceived benefits and factors associated with male partner Attendance of skilled ANC in a peri-urban community recovering from two decades of civil conflict	Cross-sectional	331 married men	31.9 [SD 8.2]	Community	Individual interviews using semi-structured questionnaire		Male partners intending their spouse to carry another pregnancy (adj. PRR 0.83; 95% CI 0.71, 0.97) Health systems: Living more than 5 km from a health facility (adj. PRR 0.83, 95% CI 0.70, 0.98) Long waiting time (41.7%), lack of, transport means (35.8%), Fear of being tested for HIV (29.7%). Non-invitation, Cultural beliefs and gender roles: No importance to their attendance Work: having a concurrent task or job demand	Knowledge of 3 or more ANC services (adj. PRR 2.77; 95% CI 2.24, 3.42), obtaining health information from facility health workers (adj. PRR 1.14; 95%CI 1.01, 1.29) and if spouse had skilled attendance at last childbirth (adj. PRR 1.31; 95% CI 1.04–1.64)

KAP, knowledge, attitudes and practices; NVP, nevirapine; RPR, rapid plasma reagin (rapid test for syphilis).

Table 2. Selected qualitative studies and components.

Study authors and country	Study aim	Study design	Population of interest	Age	Recruitment	Data collection	Role	Barriers	Enablers
(Aarnio et al. 2009) Malawi AB	Was to explore married men's perceptions of HIV in pregnancy and male involvement in antenatal HIV testing and counseling	Qualitative	Not stated	Not stated	ANC	11 FGD	Men perceived husbands' role as participation in the process indirectly through spousal communication; being faithful during pregnancy; supporting the wife if found HIV+	Cultural beliefs and gender roles: Men feel problematic to attend female-oriented care at ANC/PMTCT Knowledge: Men are mostly unaware of availability of ANC HIV testing and counseling; Reluctance to learn their HIV status Fear of the threat HIV can pose to marriage	Inclusion of men on ANC/PMTCT; Refocusing information on ANC/PMTCT to men to avoid negative social outcomes
(Auvinen et al. 2013) Zambia AB	Was to describe the views of Luba-Kasai (a Congolese tribe) men on barriers inhibiting them from the prevention of mother-to-child transmission (PMTCT) of HIV and the resources they need to implement such prevention in Lusaka, Zambia	Qualitative	21 men	Not stated	Not stated	Individual interviews	Not stated	Social economics: poverty, refugee status, absence of support arrangements Health systems: Working culture in antenatal care Knowledge: Passivity, ignorance Stigma	Not stated
(Byamugisha et al. 2010) Uganda	The aim of FGD and in-depth interviews was to explore and obtain information about the factors hindering male involvement in PMTCT and its influence	Mixed	76 men 6 men declined 24 men absent		AIDS Support Groups	FGD	Ensure family subsistence; Struggle to look for money for families	Cultural beliefs and gender roles Negative attitude to men's presence at ANC/PMTCT; perceived to be weaklings by peers; Is not good to share privacy at ANC Work and economic difficulties: Men did not have time to attend ANC with their partners; do not have enough money for transport for two people Health systems: Rudeness and rough handling of the pregnant women by the health workers; harshness and abusive manners to pregnant women; Health workers do not allow men to enter the antenatal clinics with their pregnant women; Charging of unofficial user fees; Lack of adequate space in the antenatal clinics. Long distances from communities	Refresher courses and customer care skills for health care providers; Friendly nurses and midwives; at ANC sensitization of men about ANC and PMTCT, and their benefits; Written invitation to men; Mobilization of men for ANC/PMTCT using such as fellow male peers, churches and mosques; Provision of better wages to health workers
(Chinkonde et al. 2009) Malawi	To clarify why some women who were enrolled in a PMTCT program in Lilongwe, Malawi, did not fully participate in follow-up visits in the first six months after testing HIV-positive	Qualitative	15 men		ANC	FGDs In-depth interviews	Not stated	Knowledge: Limited information about HIV/AIDS and anti-retroviral treatment	Not stated

(Duff <i>et al.</i> 2012) Uganda	To describe the perceptions of married men about barriers to accessing and accepting highly active anti-retroviral therapy (HAART) by pregnant Postnatal women positive for human immunodeficiency virus (HIV)	Qualitative	48 married men	18–45 yrs	Community	4 FGD	Not stated	Knowledge: Low knowledge of HAART and low HIV testing rate among male HAART and HIV testing misconception Lack the opportunity to be taught about HIV/AIDS and HAART Communication patterns: Lack of disclosure of a positive HIV diagnosis by women to the partner and stigma Health systems: Low men involvement in the reproductive care Women's lack of trust in confidentiality when on HAART Cultural beliefs and gender roles blame and accusation of bringing the diseases. Fears of sero-status disclosure to their partners, economic dependence, fear of physical abuse, abandonment divorce Socioeconomic: Distance; lack of money for testing fees, transport and conflict with other needs Men: Positive result interfere with men capacity to work, HIV testing a nuisance and not a priority	Not stated
(Falnes <i>et al.</i> 2011) Tanzania	To explore acceptability of PMTCT and to identify structural and cultural challenges to male involvement	Mixed	Five FGD of with 5–12 fathers 21 in-depth interviews: • Fathers • Mothers	Not identified	Villages at outdoors, private homes, churches or school buildings	FGDs In-depth interviews	Not stated	Cultural beliefs and gender roles: ANC female oriented by Definition; Organization; Program; Female domain; Not male-friendly; Women do not have authority to invite men to ANC/PMTCT; Unwelcome invitation by wife to attend a female arena Knowledge: Same HIV result as that of wife Men: Routine testing for HIV of women at ANC highly acceptable and appreciated by men, while still some resistance for partner testing, condom use and the infant feeding recommendations; 100% of those asked accepted testing of their wives; few men had tested	Empowering women Empowering men to participate by creating a male-friendly PMTCT. Offer partner testing in arenas other than the antenatal clinic. Other than the wife invite partner to test
(Karamagi <i>et al.</i> 2006) Uganda	To determine the prevalence of intimate partner violence, risk factors, partner violence and HIV prevention and PMTCT	Mixed	Not identified	Not identified	WHO/EPI cluster survey House to house	FGD 4 men	Not stated	Cultural beliefs and gender roles: Men react violently when women go for HIV testing; Disclose HIV test results; Men perceive as evidence of 'prostitution'; Multiple partners. Consumption of alcohol	Not stated

(Continued)

Table 2. Continued.

Study authors and country	Study aim	Study design	Population of interest	Age	Recruitment	Data collection	Role	Barriers	Enablers
(Koo <i>et al.</i> 2013a) South Africa	To explore the social and cultural factors underlying low rates of male-partner HIV testing during PMTCT	Qualitative	124 men		33 were referred by participants; 21 clinic staff, 15 community practitioners	In-depth interviews with 124 men; 5 FGD with physicians; nurses; HIV counselors; and community representatives	Decision-makers, Responsible for health of partner and children	<p>Cultural beliefs and gender roles: Women below men; difficult to disclose, no discussion of health if no sickness; Feeling of power inversion when women give ANC/ PMTCT information; Risk of losing protection because of HIV Knowledge: HIV status equal to wives, MTCT only occurs because of mother status; They are Faithful; HIV testing is an important part of preparing for fatherhood. Communication patterns: Difficulty of disclosure; Fears of having to surrender to HIV/AIDS; health discussion only in case of sick Health Systems: ANC/PMTCT oriented only on HIV testing not general well-being; No social expectation to test during pregnancy for fathers; Clinics are for sick and dying people; ANC/PMTCT dominated by women and female staff; Gender of VCT counselor; the negative attitude of health workers.</p> <p>Providers' judgment on men who seek VCT; Work Time away from work and life; Clinic schedule and waiting hours; clinics everything is slow</p>	Special hours and spaces for men's health; Programs about fatherhood issues; Peer education and counseling in informal social spaces; More defined roles for men to support women during PMTCT More family-oriented approaches to PMTCT; measurable improvements on strategies for men involvement on ANC/ MTCT

(Kwambai <i>et al.</i> 2013) Kenya	To provide insight into men's perceptions of maternal healthcare services and to identify factors that facilitate or constrain men's involvement in ANC and delivery care in western Kenya	Qualitative	68 married men	20–65 yrs	Community	8 FGD	Provision of financial support. Decision-makers. Helping wives to bringing flour and fetching fire wood and improve wives' diet	Cultural beliefs and gender roles: pregnancy is a women and in laws responsibility. Distrustful marriages. Communication patterns: Difficulty to disclose pregnancy and related information; Wives either distorted or withheld some information Knowledge: Men are mostly unaware of availability and aims of ANC; Reluctance to learn their HIV status; Fear of unwanted HIV disclosure and the threat HIV can pose to marriage Health Systems: men are ignored, harsh and negative attitudes toward men's participation, couple unfriendly antenatal and delivery unity infrastructure.	
(Larsson <i>et al.</i> 2010) Uganda	To examine men's own perspectives by exploring fathers' views and experiences of couple HIV testing	Qualitative	103 fathers	Rural and semi-urban area	Not identified	Homes, social spaces, outside farms	FGD 10 fathers each 5 in 2008; 4 in 2009 and 13 in-depth interviews	Ensure family's financial support; Decision-makers; exercise power over their wives	Cultural beliefs and gender roles: Pregnancy is a woman's affair; Women not authorized to request husbands to test; Men resistant to women's persuasive role including HIV testing; Polygamy, Unstable and distrustful marriages; Men adultery; Couples mutually suspicious; Couple testing Knowledge: Most men may recite the broadcasted HIV testing messages but do not go to ANC/PMTCT; Men do not understand why they should be tested without symptoms; Do not understand the importance of testing. Not informed about advantages of identifying a possible HIV infection; Social stereotypes: jealousy when man escorts wife to ANC/PMTCT clinic; Health Systems : The distance and costs, waiting times; organizational problems, special clinics and hours for testing; rudeness and impoliteness of health workers; Men uncomfortable and embarrassed due to wives' mistreatment; lack of drugs; informal payment for care; Men are unwelcome to ANC/PMTCT; Stigmatization of HIV/AIDS care

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Table 2. Continued.

Study authors and country	Study aim	Study design	Population of interest	Age	Recruitment	Data collection	Role	Barriers	Enablers
(Mlay et al. 2008) Tanzania AB	The aim was to gain insight from views of Tanzanian men and women on couple voluntary counselling and testing (CVCT) for HIV at antenatal clinics (ANC) in Tanzania	Qualitative	16 men	20–34 yrs (n = 8) and 35–75 yrs (n = 8)		FGD Depth interviews	Not stated	Cultural beliefs and gender roles: Disclosure of HIV-positive status to an HIV-negative spouse could result in abandonment, divorce or violence against the woman whether she was sero-negative or –positive	Not stated
(Mohlala et al. 2012) South Africa	To assess pregnant women and men's attitudes, feelings, beliefs, experiences and reactions to male partners' involvement in antenatal clinic (ANC) in Khayelitsha	Qualitative	30 men	19–49 yrs	Social networks by word of mouth and through the use of key informants, and by advertising community	Focus group discussion	Not stated	Cultural beliefs and gender roles: ANC is for women to check the baby status; Labor ward is the 'bush' for women; The male partner should not be allowed during birth because he will bring 'bad spirits' to the mother and baby if he has been with other women Knowledge: Men do not think it is necessary for men to go, to ANC/ PMTCT; do not see man role at ANC/PMTCT, If all is well, it is not necessary for men to attend Health Systems :some have never been asked to attend and they thought they are not needed	ANC/PMTCT as for baby health monitoring Health/ANC facility more 'male-friendly'; Invitations letters to men to attend ANC visits; Community support to men in attending ANCs Correction of misconceptions, challenging prevailing social norms
(Musheke et al. 2013) Zambia	To examine couple experiences of provider-initiated couple HIV testing at a public antenatal clinic and discusses policy and practical lessons	Qualitative	10 men	23–46 yrs	ANC	Open-ended in-depth interviews	Not stated	Some men feeling 'trapped' or 'forced' to test due to unclear information. Fear of abandonment	Not stated
(Orne-Gliemann et al. 2010) Cameroon (India, Georgia, Dominican Republic, Georgia	To assess the acceptability of couple-oriented post-test HIV counseling (COC) and men's involvement in prenatal care services within different sociocultural settings	Qualitative	92 key informant including accompanying their wives		ANC	Direct observations of health services; in-depth interviews with men, women	Not stated	Cultural beliefs and gender roles: Maternity is a woman's domain; men attending ANC seen as out of place; Health Systems: long waiting time; Clinic operational hours; ANC traditionally and programmatically a woman's environment; Accompanying men are not allowed to enter into the consultation room; Negative attitude of health workers; Work: professional obligations; Working hours make for men to attend ANC/PMTCT Couples communication pattern :Vague couple dialogue on HIV and usually happens after TV program or story of someone who is infected	Better understanding of: Couple relationships, attitudes and communication patterns; conjugal context for HIV counseling and testing

(Reece <i>et al.</i> 2010) Kenya	To assess the likelihood that male spouses will support their wives during pregnancy, and become engaged in PMTCT-related antenatal care initiatives	Qualitative	75 (51.4%) men	Not identified	ANC/Aids support group	16 in-depth FGD;	Not stated	Cultural beliefs and gender roles: Difficulty to approach employers due to belief ANC/PMTCT is for women and children; sporadic work; Communities disapprove; HIV sero-status discordance; Couples' communication patterns: Inability to communicate; Stigma; Health Systems: Distance to clinics; Transport costs; operating hours; Time per appointment; Disrespect of health staff ; Belief in traditional healing	Tangible health-related products ex: formula and drugs; Knowledge, understanding the program; Initiatives exclusively for men and led by men; men's psychosocial support groups; Clinic hours during non-work hours (e.g. weekends); CVCT; Leaders from men's support groups as peer educators; and deliver education to other men in their communities
(Theuring <i>et al.</i> 2009) Tanzania	Was to fill the existing gap on male-focused research and to learn about men's perspectives in order to identify strategies for increasing partner	Mixed	124 men	22–59 yrs	Agricultural exhibition, community event, and waiting areas in the outpatient clinics	FGD and In-depth interviews	Provision of daily subsistence; Ensure family surviving; Provide food; security and health; some men women need husband's permission for ANC/ PMTCT and Support in housework	Cultural beliefs and gender roles: men do not give attention ANC/ PMTCT services; Is not a men role to attend ANC clinics; men attend ANC clinic only before wives sickness; ANC clinics are for women only; ANC/PMTCT is for women and children; Knowledge: The concept of father's full involvement is still vague; couple testing does not give time to prepare partner how became HIV+; women positive sero-discordancy; men are afraid of testing. Work: waiting time, conflicts with working obligations; health systems: men are invited to wait outside the room; men do not know why they are invited to the clinic; and why they should attended	CVCT, kind reception, politeness, value of the services
(Walcott <i>et al.</i> 2013) Kenya	To elicit feedback on three approaches for safe HIV disclosure for pregnant women and male partners in rural Kenya	Qualitative	20 men		ANC	In-depth interviews with 20 men	Not stated	Cultural beliefs and gender roles: blame of infidelity, promiscuity, bringing the diseases Distrustful marriage Stigma and discrimination	Openness and peaceful discussion between partners

the results, could lead to domestic violence (Aarnio *et al.* 2009; Duff *et al.* 2012; Falnes *et al.* 2011; Mlay, Lugina & Becker 2008). Cases of sero-discordance, involving positive woman can culminate in divorce. If the man is positive, the consequences are lighter often involving quarrels and denial (Kiarie *et al.* 2006; Larsson *et al.* 2010).

Some communities perceived male presence at ANC/PMTCT clinics as abnormal (Larsson *et al.* 2010; Nkuoh *et al.* 2010; Theuring *et al.* 2009), making men susceptible to criticism and doubt about their masculinity, their power over their wives, and a sign of weakness (Byamugisha *et al.* 2010), bewitchment (Nyondo, Chimwaza & Muula 2014), jealousy (Larsson *et al.* 2010), and serving as an unwelcome example for other couples. Fearing peers' hostility (Falnes *et al.* 2011; Larsson *et al.* 2010; Orne-Gliemann *et al.* 2010) and shame (Nkuoh *et al.* 2010) to be the only male present (Falnes *et al.* 2011), men generally do not go to ANC/PMTCT clinics. Men's visit to clinics could be eventually justified if accompanying their sick wives (Falnes *et al.* 2011; Mohlala *et al.* 2012).

(2.4) *Men's inadequate knowledge* stated in 50% (14/28) of the studies included: Some men believing their HIV status would always be the same as that of their wives (Falnes *et al.* 2011; Katz, Kiarie, John-Stewart, Richardson, John & Farquhar 2009; Koo *et al.* 2013a), but MTCT as only the mother's responsibility (Koo *et al.* 2013a). Others were unaware of the availability of ANC HIV testing and counseling (Aarnio *et al.* 2009), felt insufficiently involved (Duff *et al.* 2012; Kwambai *et al.* 2013), unclear on the concept of the father's involvement in ANC/PMTCT (Theuring *et al.* 2009) and felt that there was a lack of opportunity to learn about HIV/AIDS and Highly Active Antiretroviral Therapy (HAART) (Chinkonde, Sundby & Martinson 2009; Duff *et al.* 2012). Some could repeat broadcasted HIV testing messages while still not going for HIV testing (Larsson *et al.* 2010). Some did not understand the role of ANC/PMTCT if the mother and baby were well (Mohlala *et al.* 2012) or see the advantages of testing where there were no symptoms (Auvinen, Kylmä, Välimäki, Bweupe & Suominen 2013; Larsson *et al.* 2010; Theuring *et al.* 2009).

(2.5) *Men's fearful attitudes regarding PMTCT*: The fear of positive results (Aarnio *et al.* 2009; Koo *et al.* 2013a; Kwambai *et al.* 2013; Mulongo, Schirvel, Mukalay wa Mukalay & Dramaix 2010; Theuring *et al.* 2009), unwanted HIV disclosure (Kwambai *et al.* 2013), stigma (Auvinen *et al.* 2013; Chinkonde *et al.* 2009; Duff *et al.* 2012; Larsson *et al.* 2010; Musheke *et al.* 2013; Walcott *et al.* 2013) and marital disharmony after HIV results were factors also mentioned (Aarnio *et al.* 2009; Auvinen *et al.* 2013; Duff *et al.* 2012; Kwambai *et al.* 2013; Larsson *et al.* 2010; Musheke *et al.* 2013).

(2.6) *Distrustful marriages and couples' communication patterns*: Some men described their marriages as unstable and distrustful (Auvinen *et al.* 2013; Larsson *et al.* 2010; Reece *et al.* 2010; Walcott *et al.* 2013) with mutual suspicions of extra-marital relationships, but particularly among men (Koo *et al.* 2013a; Larsson *et al.* 2010). On the other hand, some traditional norms prohibit women to initiate HIV and reproductive health conversations (Larsson *et al.* 2010), others intentionally neglect

information provided by wives (Larsson *et al.* 2010). These situations contribute to turning communication around HIV infection into a sensitive and intricate subject, told in the third person (Koo *et al.* 2013a; Larsson *et al.* 2010; Orne-Gliemann *et al.* 2010; Reece *et al.* 2010). Other men suspect that their wives have either distorted or withheld some information (Chinkonde *et al.* 2009; Musheke *et al.* 2013) and feel forced into getting tested by their partners, with the collusion of health workers (Musheke *et al.* 2013), some have never been requested to attend ANC/PMTCT sessions and thought they were not needed (Mohlala *et al.* 2012).

(3) *Male enablers to participating in PMTCT* cited in 53% (15/28) of the studies were:

(3.1) *Stable marriages*: men were more disposed to participate in ANC/PMTCT if living with their partners (Falnes *et al.* 2011; Katz *et al.* 2009; Larsson *et al.* 2010) as a monogamous couple (Brou, Djohan, Becquet, Allou, Ekouevi, Viho, *et al.* 2007; Katz *et al.* 2009), and to discuss HIV if married, in an exclusive relationship (Koo *et al.* 2013b) and having children (Falnes *et al.* 2011; Katz *et al.* 2009; Msuya *et al.* 2008; Reece *et al.* 2010; Tweheyo *et al.* 2010). Men were 3.5 times more likely to be tested if they were aware of their wives' sero-status (Brou *et al.* 2007; Koo *et al.* 2013a) and informed about HIV testing by their wives (Reece *et al.* 2010).

(3.2) *Male-friendly PMTCT services were dependent* on availability of specific information on ANC/PMTCT directed toward men (Aarnio *et al.* 2009; Byamugisha *et al.* 2010; Mohlala *et al.* 2012; Reece *et al.* 2010; Theuring *et al.* 2009), understanding of the value of the services offered, and the kindness and politeness of health workers (Reece *et al.* 2010; Theuring *et al.* 2009). Men were also keen to receive invitation letters, health information addressed directly to them from health workers and those other than their partners (Byamugisha *et al.* 2010; Mohlala *et al.* 2012; Reece *et al.* 2010; Theuring *et al.* 2009), and clinic hours during non-work period such as weekends, appointments outside ANC/PMTCT clinics, for example, at their homes or work places (Larsson *et al.* 2010; Reece *et al.* 2010). Men were also in favor of learning more about fatherhood issues, couples' VCT, existence of health products, drugs and promotion of refresher courses and customer care skills for healthcare providers (Byamugisha *et al.* 2010).

(3.3) *Age*: Adult men were more willing to participate in ANC/PMTCT sessions (Byamugisha *et al.* 2010; Katz *et al.* 2009; Koo *et al.* 2013a; Mlay *et al.* 2008; Mohlala *et al.* 2012; Msuya *et al.* 2008; Musheke *et al.* 2013). Figures from Cameroon show that ANC knowledge was higher among 20- to 39-year-old men favoring their participation in PMTCT (Nkuoh *et al.* 2010).

(3.4) *Education*: In South Africa (Koo *et al.* 2013a), men with higher levels of education were 5.8 times more likely to attend ANC clinics, and 2.7 times more likely to be tested for HIV in Ivory Coast (Brou *et al.* 2007). Data from two studies in Uganda showed that the literacy rate was high among male participants and varied from 74% (Byamugisha *et al.* 2010) to nearly 90% (Larsson *et al.* 2010).

(3.5) *Employment*: Most men who participated in the studies included in this review were employed (Msuya *et al.* 2008). For 58 (47%) men, it was important to receive an official letter to present to their employers for permission to attend ANC/PMTCT clinics (Reece *et al.* 2010).

(3.6) *Men's empowerment*: Promotion of couple- and family-centered PMTCT interventions (Koo *et al.* 2013a) and mobilization of men for PMTCT using male peers, churches and mosques were found to be effective (Byamugisha *et al.* 2010). Encouraging initiatives exclusively for men, led by men, promoting men's psychosocial support groups, community education through men's support groups as peer educators are all approaches that support men to attend PMTCT sessions as well as to continue sensitizing and educating other men in their communities (Mohlala *et al.* 2012; Reece *et al.* 2010). It is important that the role of men is clearly defined to better support women at PMTCT (Koo *et al.* 2013a; Mohlala *et al.* 2012).

(3.7) *Better communication among couples*: Men were in favor of open and peaceful discussion between partners (Walcott *et al.* 2013) and more family-oriented approaches by health workers (Koo *et al.* 2013a). More understanding of communication patterns in the context of HIV counseling and testing can facilitate more effective services (Orne-Gliemann *et al.* 2010).

Discussion

This review reiterates the low level of male partners' involvement in PMTCT. Fig. 2 summarizes multiple factors that influence men's involvement in PMTCT. The need and demand for men involvement at PMTCT clinics are influenced by the prevailing understanding of PMTCT not being a men's role, but rather a women's issue (Aarnio *et al.* 2009; Duff *et al.* 2012; Larsson *et al.* 2010; Nkuoh *et al.* 2010; Theuring *et al.* 2009; Tweheyo *et al.* 2010). The role of men is perceived rather to be as provider of money for family sustenance and payment of eventual costs for care related to delivery or baby care (Falnes *et al.* 2011; Larsson *et al.* 2010; Mohlala *et al.* 2012; Nkuoh *et al.* 2010; Orne-Gliemann *et al.* 2010; Reece *et al.* 2010; Theuring *et al.* 2009). Traditional cultural concepts about gender roles (Falnes *et al.* 2011; Reece *et al.* 2010; Theuring *et al.* 2009) and social constructions (Tweheyo *et al.* 2010) favoring male partner superiority may inhibit them to assume a more active role in PMTCT. On the other hand, the perceived inferiority of women (Duff *et al.* 2012; Falnes *et al.* 2011; Larsson *et al.* 2010) and their greater responsibility over pregnancy and childbearing (Falnes *et al.* 2011; Larsson *et al.* 2010; Theuring *et al.* 2009) contribute for their greater role and eventually lonesome involvement in PMTCT.

Some men miss opportunities to participate in PMTCT because they neglect information given by their female partners (Duff *et al.* 2012; Falnes *et al.* 2011; Larsson *et al.* 2010). Nevertheless, some men express lack of knowledge and awareness for their insufficient involvement with their spouses' pregnancy and PMTCT process (Duff *et al.* 2012; Kwambai *et al.* 2013; Larsson *et al.* 2010). Men were not concerned with getting tested or with prevention of HIV infection from mother to their child even though they were able to

repeat the broadcasted HIV prevention messages (Larsson *et al.* 2010). These attitudes and behaviors highlight the need for urgent improvement of men's involvement through multi-sectoral approaches, including those aimed at communities, in order to produce behavior change, decrease negative beliefs and cultural practices.

Besides work commitments (Theuring *et al.* 2009) and alleged lack of time (Aarnio *et al.* 2009; Byamugisha *et al.* 2010; Falnes *et al.* 2011; Larsson *et al.* 2010; Mulongo *et al.* 2010; Nkuoh *et al.* 2010; Theuring *et al.* 2009) reported in reviewed studies, there is also a lack of legislation ensuring fathers' greater participation at PMTCT (Orne-Gliemann *et al.* 2010; Tweheyo *et al.* 2010). This legislative gap is even worse when employers also understand PMTCT as women issue (Nkuoh *et al.* 2010; Reece *et al.* 2010) and hinder their male employees from attending PMTCT services (Larsson *et al.* 2010). Additionally, men fear to be asked by their employers to disclose their HIV status, which may also prevent them from asking permission to attend PMTCT sessions with their spouses (Reece *et al.* 2010). Money constraints may also be a real barrier for male partner PMTCT attendance (Byamugisha *et al.* 2010; Duff *et al.* 2012; Reece *et al.* 2010; Tweheyo *et al.* 2010). However, reviewed studies make no mention of increasing male partner attendance even if PMTCT services are free of charge.

For the most conservative communities among the sub-SSA Countries included in this study, pregnancy and childbearing are female responsibility (Larsson *et al.* 2010; Reece *et al.* 2010; Theuring *et al.* 2009) and family provision, more a male duty. There is no culturally perceived role for male partners at PMTCT (Byamugisha *et al.* 2010; Koo *et al.* 2013a). Also, women are prohibited from discussing sexual and reproductive issues with their male partners (Koo *et al.* 2013a; Larsson *et al.* 2010), restricting therefore sharing of information and appeal for their male partners involvement at PMTCT (Duff *et al.* 2012). So, an important role has to be played by the less traditionalist community members (open-minded or unprejudiced), civil society faith-based organizations, traditional healers and traditional birth attendants in promoting reforms of community norms and taboos (Byamugisha *et al.* 2010; Larsson *et al.* 2010; Mohlala *et al.* 2012) to enhance men understanding of their parenthood role and need for their involvement in PMTCT.

Even though men acknowledge the (Koo *et al.* 2013a; Kwambai *et al.* 2013) challenges women face in directing conversations, most of them still are not receptive to discuss HIV-related issues which contributes to couples' communication gaps and misunderstandings (Larsson *et al.* 2010; Orne-Gliemann *et al.* 2010; Reece *et al.* 2010; Villar-Loubet, Bruscantini, Shikwane, Weiss, Peltzer & Jones 2013). Having monogamic families (Brou *et al.* 2007), having children (Katz *et al.* 2009), stable and faithful relationships (Koo *et al.* 2013b) were all identified as enabling factors. However, polygamy and extra-marital relationships are relatively common in these settings and may interfere in males' involvement in PMTCT.

Globally and at country level, the PMTCT policies have been conceived to promote female reproductive and sexual rights.

However, in more traditional settings in SSA Countries, the political focus on HIV epidemic feminization, PMTCT (Falnes *et al.* 2011) and the greater emphasis on mother and child health may reinforce some men's cultural background which tends to confer on women all responsibility for pregnancy, blame for eventual HIV infection and transmission to the child (Falnes *et al.* 2011). This seems to be one of the reasons why MCH nurses often feel not prepared to address health, sexual and reproductive needs of men (Koo *et al.* 2013a; Larsson *et al.* 2010).

We can conclude that the relationship of men with their community's cultural beliefs, social norms, work commitments, local health policies and healthcare delivery systems are some important factors influencing men's involvement in PMTCT. At global and local levels, reproductive and sexual health approaches should be revised to address men's, women's and community's roles in reproductive health and childbirth. Thus, there is a need for greater education, health and labor sector reforms that contribute to improve national policies and strategies for men's involvement in PMTCT. Innovative multi-sectoral reforms aimed at men's involvement in PMTCT should also promote free health services to diminish the financial pressure on the financially more vulnerable men. Due to the urgency of improving men's involvement in PMTCT, feasible low-cost enablers should be better explored and implemented, for instance, the involvement of male community leaders and faith-based organizations, employers, training of health workers to improve understanding of male health and reproductive needs. Innovative strategies should also see opportunities for scheduling men or couples for weekday afternoon PMTCT services.

Although the findings of this review present valuable evidence about the roles, barriers and enablers of men's involvement with PMTCT, there are some limitations to consider. The review analyzed only reported evidence from published studies retrieved from PubMed and Google Scholar, which might exclude some studies and/or evidence such as existing gray literature in SSA Countries. On the other, the SSA Countries are very diverse in terms of ethno-cultural background and thus the evidence produced in this study might not be generalizable to all diverse settings (urban, rural, etc.) and contexts in these countries.

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